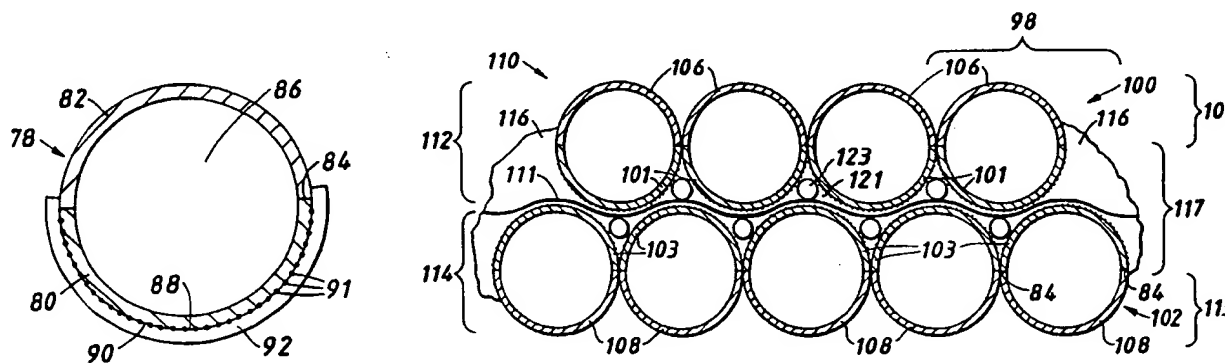




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(54) Title: FUEL CELL STACK MADE OF TUBE CELLS, AND INTERNAL COOLING ARRANGEMENT THEREFOR



(57) Abstract

A PEM-type fuel cell is formed from two transversely arrayed layers (112, 114) of parallel circular cylindrical tubes (78) of equal diameter, between which layers is a layer of membrane material (116). The portions (82) of the tubes that are not to be in electrochemical contact with the membrane are reactant gas-impermeable, and the portions of the tubes that are to be in contact with the membrane are electro-catalyzed. Preferably, the layers of tubes are transversely offset from one other by half the diameter of a tube so as to minimize the thickness of the combined fuel cell in the stack dimension. Adjacent sequential fuel cells in a stack are also preferably transversely offset from each other so as to minimize the total combined thickness of the fuel cells in the stack dimension. Cooling may be provided by conduits running between adjacent tubes in the flow dimension in otherwise unused spaces between the reactant gas-impermeable portions of the tubes of adjacent fuel cells. Porous humidification conduits may also be conveniently provided in similar unused spaces between the tubes.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H01M8/10 H01M8/24 H01M8/02 H01M8/04 H01M4/86

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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☒ Patent family members are listed in annex.

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